Original Article
DOI: https://doi.org/10.70749/ijbr.v3i7.2082

INDUS JOURNAL OF BIOSCIENCE RESEARCH
https://induspublishers.com/IJBR
ISSN: 2960-2793/ 2960-2807

Frequency of Autonomic Dysfunction in Patients with Guillain Barre Syndrome

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ARTICLE INFO

Keywords: Guillain-Barre Syndrome (GBS), Autonomic Dysfunction (AD), Frequency, Outcomes.

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Declaration
Authors' Contribution
Both authors equally contributed to the study and approved the final manuscript

Conflict of Interest: No conflict of interest.

Funding: No funding received by the authors.

Article History
Received: 19-05-2025 Revised: 28-06-2025
Accepted: 07-07-2025 Published: 15-07-2025

ABSTRACT

Background and Aim: Guillain-Barre syndrome (GBS) described as a syndrome manifesting clinically as an acute inflammatory polyradiculoneuropathy (AIDP) with concomitant, symmetrical muscular weakness with absent or diminished deep tendon reflexes. Autonomic dysfunction (AD) is frequent and clinically important complication of GBS, which potentially contributes to adequate sickness and even mortality. The present study aimed to determine the frequency of AD in GBS patients. **Patients and Method:** This cross-sectional study investigated 100 patients presenting with new onset Guillain Barre Syndrome in the department of Neurology, Mayo Hospital, Lahore from October 2024 to April 2025. Patients aged 18-65 years of either gender presented with new onset GBS were enrolled. Diagnosis of GBS was established through clinical assessment and supported by relevant investigations, including cerebrospinal fluid analysis and nerve conduction studies. Demographic information and illness duration recorded. All patients were evaluated for the presence of autonomic dysfunction (AD) using a standardized operational definition. Data analysis done using SPSS version 27. **Results:** The overall mean age was 37.82±4.62 years. Among the 100 patients diagnosed with Guillain-Barre syndrome, autonomic dysfunction (AD) seen in 38% of cases. The most common manifestations of AD included fluctuation in blood pressure (26%), cardiac arrhythmia (18%), and urinary retention (12%). AD seen more often in patients over 40 years of age and in patients with severe motor weakness. No significant gender-based differences in the frequency of AD observed. **Conclusion:** Autonomic dysfunction (AD) represents a frequent and significant complication in Guillain-Barre syndrome, affecting over one-third of affected individuals. Timely recognition and monitoring of autonomic symptoms are vital, as they play an important role in determining clinical outcomes and are associated with high risks of morbidity and mortality.

INTRODUCTION

The Guillain-Barre syndrome (GBS), first described in France in 1916, is an acute neuropathy, characterized by acute areflexic paralysis with elevated proteins and normal cell counts on CSF (albuminocytologic dissociation) and findings on nerve conduction studies[1]. Preceded by poliomyelitis, GBS is now the commonest cause of acute flaccid paralysis globally and recognized as a neurological emergency often causes considerable clinical concern and emotional distress due to its rapid progression and potential severity[2]. Autonomic dysfunction (AD) may appear in different types of forms, including cardiovascular instability (such as blood pressure fluctuations and arrhythmias), urinary retention, pupillary dysfunction and impaired thermoregulation. Symptoms of autonomic dysfunction (AD) may be temporary or long lasting, varying in severity from mild to life-threatening[3]. Importantly, autonomic dysfunction can be found independently or with motor symptoms and has been reported to contribute significantly to morbidity and mortality in GBS patients[4].

The frequency reported in the GBS varies widely in literature, from 20% to 70%, clinical criteria, based on studied population and clinical settings[5, 6]. The initial identity of autonomic participation is important, as it enables timely intervention that can prevent serious complications such as cardiac arrest, fatal high blood pressure, or sudden death. Guillain-Bare Syndrome has been reported globally, with an estimated annual event of 1-2 cases per 100,000 individuals[7]. The early diagnosis of Guillain-Bare syndrome (GBS) is primarily clinical, based on characteristic signs and symptoms. Clinical diagnosis further strengthened with albuminoctylogical dissociation on CSF and suggestive electrophysiological patterns on electrodiagnostic studies[8]. Weakness frequently begins in the lower limbs; however, in about 10% of cases, facial muscles may be involved in the early disease course[9]. Respiratory muscle involvement is a serious complication;

with 10% to 30% of patients require mechanical ventilation[10, 11]. Other clinical features include involvement of cranial nerves, especially the facial and oculomotor nerves, reduced or absent reflexes (areflexia/hyporeflexia) and sensory abnormalities like paresthesias and pain during the acute stage[12].

While international data suggest that AD occurs in a significant proportion of GBS patients, its prevalence and clinical profile remain underexplored in the Pakistani population. The lack of local data presents a barrier to effective risk stratification and timely intervention. Given the potential impact of AD on patient prognosis, intensive care needs, and overall management strategies, it is crucial to investigate its occurrence in tertiary care settings within Pakistan. This study aims to determine the frequency and characteristics of autonomic dysfunction in patients with GBS, thereby improving clinical awareness and informing better monitoring and therapeutic practices in acute neurological care.

METHODOLOGY

Study Design and Setting

This cross-sectional study was conducted in the Department of Neurology, Mayo Hospital, Lahore from October 2024 to April 2025. A total of 100 patients aged 18-60 years of both genders diagnosed with new onset Guillain Barre Syndrome were enrolled. Patients with a history of GBS, stroke, head trauma, pregnant females, patients with GCS less than 8, patients on corticosteroids, and patients with any other co-morbid / medical condition attributing to autonomic dysfunction excluded. The sample size 100 patients was calculated based on 7% margin of error, 95 % confidence level and taking expected frequency of autonomic dysfunction as 41.53%[8]. Autonomic Dysfunction (AD) was defined as the presence of any of the following i) Labile blood pressure, characterized by a fluctuation of more than 20% in systolic or diastolic blood pressure measured in both supine and upright positions. These fluctuations were assessed at intervals and observed more than twice within a 24-hour period. ii) Fluctuation ((labile) Heart rate :> If examined at an interval of one hour, a fluctuation in heart rate exceeding ±10% from the baseline value, occurring at least twice (i.e., two or more increases or decreases) within a 24-hour period. iii) Urine retention: defined as the absence of urine output for at least 12 hours despite the intake of a minimum of 1500 mL of oral fluids, with ultrasound confirmation of a distended urinary bladder. iv) Gastrointestinal autonomic dysfunction, characterized by either diarrhea (three or more loose stools within 24 hours) or constipation (fewer than two bowel movements within 48 hours).

After obtaining ethical approval from KEMU Institutional Review Board (IRB), eligible patients were enrolled using non-probability samples technique. A detailed history obtained from every patient or their attendant, including demographics (age, gender), symptoms and duration of the disease. The clinical assessment focuses on motor weakness, reflex status, sensory symptoms, and cranial nerve involvement. All patients conducted a cerebrospinal fluid (CSF) analysis and electrodiagnostic study to confirm the diagnosis of GBS.

All the data entered and analyzed using SPSS version 27.0. Quantitative variables such as age, and duration of disease presented as mean ± standard deviation (SD). Categorical variables such as gender and autonomic dysfunction, expressed as frequencies and percentages. Data were stratified for age, gender, BMI and duration of disease. Post stratification chi-square test was applied taking p value < 0.05 as significant.

RESULTS

A total of 100 patients diagnosed with Guillain-Barre syndrome (GBS) with overall mean age of 37.82±4.62 years (18 to 65 years) enrolled. Of the 100 patients, autonomic dysfunction (AD) seen in 38 (38%) cases. The most frequently reported manifestation of AD: blood pressure fluctuations in 26 (26%) patients, cardiac arrhythmia in 18 (18%) patients, and urinary retention in 12 (12%) patients as shown in Figure-1. Autonomic dysfunction was more prevalent in patients over 40 years of age with 24 out of 38 (63.2%) cases occurring in this age group as shown in Figure-2. Additionally, a high frequency of autonomic dysfunction (AD) has been reported in patients with severe motor weakness. Demographic and Clinical Characteristics of GBS Patients is shown in Table-I. Based on the stratified data, autonomic dysfunction (AD) was significantly more prevalent among patients older than 40 years, with 63.2% affected compared to 22.6% in those aged 40 years or below ($p < 0.05$). No statistically significant association was found between gender and AD, as 36.2% of males and 40.5% of females experienced AD ($p > 0.05$). Similarly, although the frequency of AD appeared slightly higher among overweight (39.5%) and obese patients (43.8%) compared to those with normal BMI (34.8%), the difference was not statistically significant ($p > 0.05$). Patients with disease duration longer than 7 days had a higher rate of AD (45.0%) compared to those with shorter duration (33.3%), but this difference was also not statistically significant ($p > 0.05$).Stratification of Autonomic Dysfunction in GBS Patients with respect to age, gender, BMI, and disease duration are shown in Table-II.

Table 1

Demographic and Clinical Characteristics of GBS Patients (n = 100)

Variable	Value
Mean Age (years)	37.82 ± 4.62
Gender	Male: 56 (56%), Female: 44 (44%)
Autonomic Dysfunction Present	38 (38%)
BP Fluctuations	26 (26%)
Cardiac Arrhythmias	18 (18%)
Urinary Retention	12 (12%)
AD in Age > 40 years	24/38 (63.2%)
Gender-Based AD Frequency	No significant difference ($p > 0.05$)

Figure 1
Autonomic dysfunction (AD) Manifestations

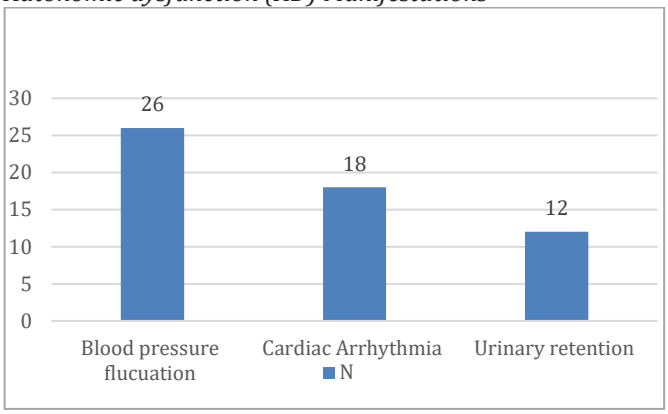

Figure 2
Overall Prevalence of AD (N=100)

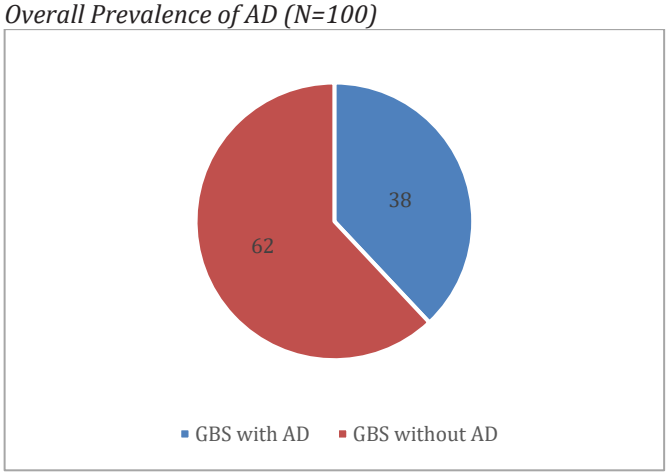

Figure 3
AD Frequency by Age Group (N=38)

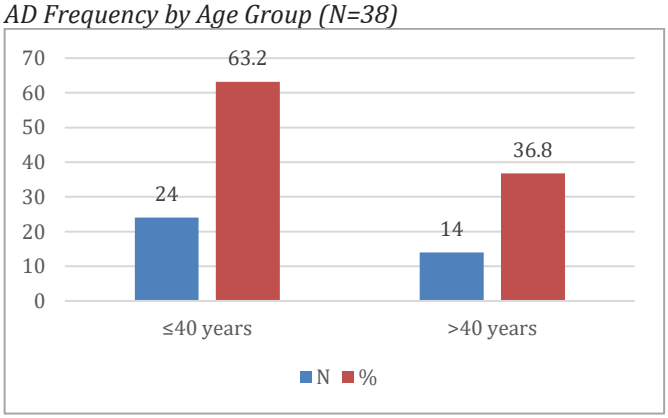

Table II
Stratification of Autonomic Dysfunction in GBS Patients (n = 100) with respect to age, gender, BMI, and disease duration (N=100)

Variable	Subgroup	No. of Patients (n)	AD Present N (%)	p-value
Age	≤ 40 years	62	14 (22.6%)	
	> 40 years	38	24 (63.2%)	**< 0.05** (S)
Gender	Male	58	21 (36.2%)	
	Female	42	17 (40.5%)	> 0.05 (NS)
BMI	< 25 (Normal)	46	16 (34.8%)	
	25–29.9 (Overweight)	38	15 (39.5%)	
	≥ 30 (Obese)	16	7 (43.8%)	> 0.05 (NS)*
Disease Duration	≤ 7 days	60	20 (33.3%)	
	> 7 days	40	18 (45.0%)	> 0.05 (NS)*

**S: Significant NS: Not significant*

DISCUSSION

The current study highlights a significant frequency of autonomic dysfunction (AD) in patients with Guillain-Barré Syndrome (GBS), with 38% of patients exhibiting at least one form of AD. This finding aligns with previous literature, which reports AD in approximately 20–65% of GBS cases, underscoring the importance of monitoring autonomic symptoms throughout the clinical course of the disease. Early identification and appropriate management of GBS associated complications are crucial, as they known to significantly contribute to morbidity and mortality[13, 14].

Among the autonomic manifestations observed, the blood pressure fluctuation emerged as the most common, followed by cardiac arrhythmia (18%) and urinary retention (12%). These findings align with established pathophysiological understanding, which suggests that demyelination and axonal injury to autonomic fibers impair the regulation of cardiovascular and urogenital functions. Labile blood pressure, in particular, can be life threatening, and if not managed properly, end-of-limb damage may occur. Therefore, regular hemodynamic monitoring recommended for patients with suspected or confirmed autonomic dysfunction (AD). These results resembles the earlier studies findings[15-17].

In patients over 40 years of age, autonomic dysfunction (AD) more frequently observed; supporting existing evidence that increasing age is a risk factor for severe morbidity and complications in Guillain-Barré Syndrome (GBS). The likelihood and severity of dysautonomia increase with age due to the decline in autonomic regulation, presence of comorbidities, and reduced physiological reserve. Physicians should exercise heightened vigilance when managing chronic GBS patients, carefully monitoring for both subtle and overt signs of autonomic dysfunction[18].

Additionally, the increasing incidence of AD in patients with severe motor weakness underlines the potential relationship between neurological participation and boundary of autonomic instability. Severe motor dysfunction can reflect more widely disintegration, including autonomic fiber, thus leading to multisystem participation. It confirms the need for extensive neurological and systemic evaluation in patients with high-grade motor damage[19, 20].

Interestingly, no significant gender differences were observed in the frequency of autonomic dysfunction (AD), suggesting that gender may not influence the occurrence of AD in Guillain-Barré Syndrome (GBS). Although some studies report a slightly higher incidence of GBS in men, the development of AD appears to be independent of gender, indicating that other host-related or disease-specific factors may play a more prominent role [21-23].

In comparison with previous regional studies, the 38% AD frequency found in this cohort appears moderately high. This may reflect differences in diagnostic vigilance, population characteristics, or healthcare access. Additionally, Varying definitions and methods of

assessment for AD across studies contribute to heterogeneity in reported frequencies. Standardized clinical protocols will enhance the comparability of findings and enable the reproducibility of results across different clinical settings[24, 25].

Overall, the results of this study emphasize the clinical importance of identifying and managing autonomic dysfunction in GBS. Given that autonomic dysfunction can develop rapidly and may not consistently correlate with the severity of motor weakness, physicians should maintain a high index of doubt, especially in older adults and people with broad neurological involvement. Further studies with larger sample sizes and longitudinal follow-up warranted to investigate the immunological implications of autonomic dysfunction (AD) and evaluate the effectiveness of various management strategies.

CONCLUSION

The study found that the frequency of autonomic dysfunction (AD) in Guillain-Barre syndrome (GBS) patients was 38%. The most frequently observed autonomic disturbances were fluctuating blood pressure, cardiac arrhythmia and urinary retention. AD were more prevalent in patients over 40 years of age and in patients with severe motor weakness, exposing the need for close monitoring in these high -risk groups. However, no significant correlation found between the gender and the incidence of AD. These findings highlight the importance of early recognition and proactive management of autonomic symptoms to reduce potential complications and improve clinical outcomes in patients with Guillain-Barré Syndrome (GBS).

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